13. The semiconductor device of claim 11

wherein the memory cell is associated with a read voltage;

wherein the memory cell is configured to produce a read current in response to a resistance state of the memory cell and to the read voltage;

wherein the read voltage is greater than the hold voltage; and

wherein the read voltage is less than the program threshold voltage.

14. The semiconductor device of claim 11

wherein the memory cell is associated with an erase threshold voltage;

wherein the resistance state of the memory cell is configured to change from the low resistance state to the high resistance state upon application of an erase voltage of same polarity and higher magnitude than the erase threshold voltage; and

wherein the resistance state of the non-linear element is configured to change from the high resistance state to the low resistance state upon application of the erase voltage.

15. The semiconductor device of claim 11 wherein the resistance state of the non-linear element is configured to change from the low resistance state to the high resistance state upon absence of a voltage across the non-linear element having a higher magnitude than the hold voltage.

16. The semiconductor device of claim 11 wherein the first electrode comprises metal or a metal alloy including a metal selected from a group consisting of: gold, nickel, and aluminum.

17. The semiconductor device of claim 16 wherein metal particles from the first electrode are diffused within the memory cell.

18. The semiconductor device of claim 17 wherein the metal particles are trapped within defects within the memory cell and form a conductive filament within the memory cell.

19. The semiconductor device of claim 11 wherein the memory cell comprises a resistive switching material selected from a group consisting of: a metal oxide, ZnO, W03, TiOx, NiO, CuO, and a chalcogenide glass.

20. The semiconductor device of claim 11 wherein the non-linear element comprises a material selected from a group consisting of: an oxide material, Hf02, a dielectric material, and a combination of dielectric materials.

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